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ABSTRACT

One of the factors inhibiting development of a more descriptive theory of communication has been a poorly defined conceptual framework which places almost exclusive emphasis on verbal messages and overlooks an important feature of the communication process, the fact that effective communication develops from interaction among various message components. Theorists have posed a sharp distinction between verbal and nonverbal behaviors, although the function of both forms, the communication of information, is the same. Human communication is mediated by many channels and encoded in a variety of ways by individuals who utilize different amounts of intention, awareness, and feedback. The more descriptive communication model postualted is based on three dimensions: channel, code, and propositionality. Channels contain four separate media: voice, body, objects, and environmental physical features. The three types of both digital and analogic coding are intrinsic, iconic intrinsic, and arbitrary extrinsic. The third dimension is determined by the interaction of intent, awareness, and feedback. (RN)

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NONVERBAL EXPRESSIVE BEHAVIOR IN AN INTEGRATED MODEL OF HUMAN COMMUNICATION

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The development of a more descriptive theory of communication has been inhibited by at least two factors, the complexity of the process of communication and a poorly defined conceptual framework. The former we can do little about and so must be content to live with the knotted complexities of the raw material of our studies, but the latter must be improved if communication is to be better understood. The principle limiting feature of the conceptual framework within which most current theoretical positions have developed is the almost exclusive emphasis placed upon verbal messages. The assumption that primary communicative activity resides solely within the verbal mode has for too long been accepted without question. Because of this assumption, message content has been assigned to the verbal mode and the secondary, relational functions of repeating, contradicting, complementing, supplementing, accenting or regulating have been relegated to the nonverbal mode. We hold that a view which postulates separate functions for the two modes overlooks an important system feature of the communication process, i.e., effective communication arises from the interaction among message components regardless of the modality of expression. In this paper we propose a model of communication which integrates communicative behaviors by considering the commonalities rather than the differences between modes.

There are a number of factors which contribute to the limiting view of communication which postulates a neat division between verbal and nonverbal behaviors. First, in an attempt to construct an orderly view of communication theorists have established a useful, but too literal, distinction between

verbal and nonverbal behaviors. The distinction is useful only insofar as it provides an awareness of the modes of transmitting information. If, as many assume, the distinction suggests separate functions for the separate modes, it has been applied too literally. The function for both modes remains the communication of information. Of course, the mode may specify the details of the process employed in transmission. For instance, verbal communication utilizes the repertoire of linguistic symbols and is governed by the linguistic conventions of a given culture; nonverbal communication utilizes nonlinguistic signs and symbols and is not normally bound by linguistic conventions. Dance (1967) suggests an approach which makes clear the differences in code and channel. Figure 1 represents Dance's distinction between verbal and nonverbal codes and vocal and nonvocal channels.

Figure 1 in about here

Note that the horizontal dimension presents a simple dichotomy between verbal and nonverbal behaviors which apparently differentiates between methods of encoding. Dance defines verbal communication as the expression of abstraction of many specific instances by one sign which, through learning or training, becomes a sign of signs or symbol. Nonverbal communication is not thoroughly defined by Dance because the principal orientation of his position is speech communication. It is speech communication, according to Dance, which distinguishes that aspect of communication which is peculiarly human, and the "symbolic essence" of speech makes it an uniquely human behavior. However, speech is not the only modality of human communication. Human communication involves the activity of other modalities which a descriptive theory or model must consider.

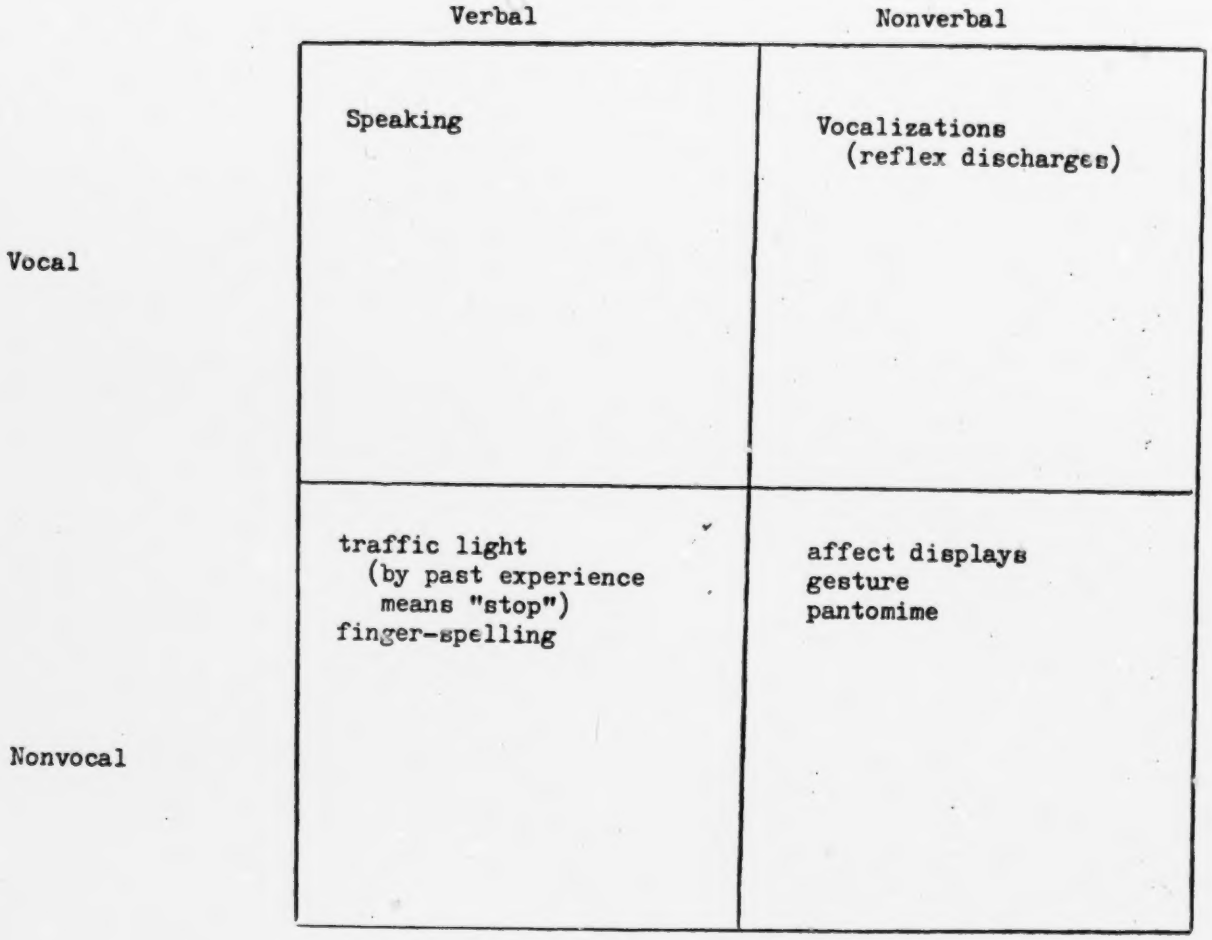

Figure 1. The four-fold descriptive table derived from Dance (1967) accounts for expressive behaviors according to channel and code. However, channel and code are not well defined.

Further, the dichotomy between verbal and nonverbal, taken as references to methods of encoding, cannot account for certain speech behaviors which are encoded through other than symbolic means. Language is a symbolic activity which gains significance or meaning through the digital encoding of referent objects and events in verbal symbolism. Language is generally not considered an analogic activity. That is, the arbitrary conventions of culture and language groups result in a digital code which ascribes certain meanings to certain activities of the vocal mechanism. However, some of these activities of the vocal mechanism rely upon an analogic relationship with their referents and in that manner gain significance or meaning. These behaviors are not defined as either verbal or nonverbal if we rely soley upon their "symbolic essence."

Figure 2 in about here

Figure 2 is a representation of Dance's original four-fold table to which we have added a middle ground which accounts for behaviors which are not clearly verbal or nonverbal. For example, onomatopoeia, sometimes called oral gesture or pantomime, is considered an analog of its referent rather than a digital representation of it. Similarly, American Sign Language has both verbal and nonverbal components in that some signs have digitally encoded verbal counterparts while others are analogs of their referents. In other cases, however, Dance's distinction between code and channel accurately identifies the behavior as either verbal or nonverbal. The finger-spelling system used in the formal training of the deaf is a good example. Some may include this system among nonverbal behaviors, but it is clearly verbal. Finger-spelling involves an unconventional production of the conventional linguistic symbols normally employed

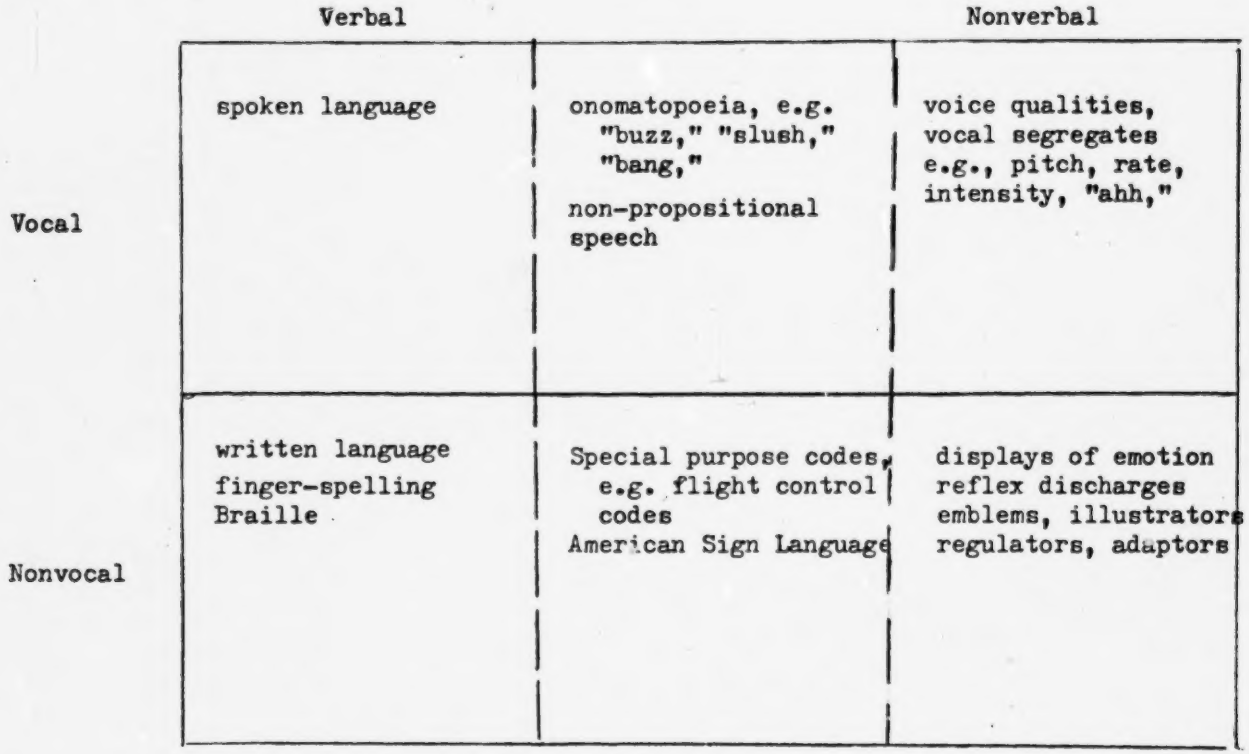

Figure 2. Dance's verbal and nonverbal categories exclude certain vocal and nonvocal behaviors. The area between categories (indicated by dotted lines) includes behaviors which can be better described by a more detailed consideration of encoding.

in reading and writing. On the other hand, vocal reflex discharges, screams, burps, sneezes, raspberries, laughter, etc., are produced by the same apparatus which is employed in verbalizing, and yet they remain essentially nonverbal. They are nonverbal because they do not employ conventional linguistic symbolism. Dance's approach leaves unclear the nature of independent message components and their interrelationship.

What is needed for clarification of the relationship between expressive behaviors is a theory or model which departs from the traditional, too narrow division into verbal and nonverbal categories. The two categories are defined by the differences in coding principles which govern the communicative behavior. Perhaps a direct consideration of coding, without reference to the mode of expression, would provide a more efficient method of analysis or identification. The complex range of communicative behaviors available to the human organism suggests a continuum of coding methods. Further, the vertical dimension of Dance's double dichotomy could profit from elaboration. The identification of communicative behaviors in either a vocal or nonvocal channel does not well describe the rich potential for information transmission in other channels of human communication. The vertical dimension suggests multiple channels capable of simultaneous activity.

However, there are those who argue that clarification could be better achieved through simplification. Skinner (1957) presents a radical simplification in his functional analysis of verbal behavior. According to Skinner, an understanding of communicative behavior is best achieved by looking only at the external manifestations of that behavior and foregoing any statement about internal psychological processes, e.g., encoding, intention, sentiment, attitude, etc.. He insists that the psychologist's first responsibility is description.

To that end, Skinner identifies the conditions relevant to the occurence of verbal behavior and the variables of which it is a function. However valid Skinner's criticism of traditional approaches may be, his new formulation rests upon a severely limited definition of verbal behavior which does not fully identify and describe the behaviors per se or the internal processes through which such behaviors come to have a predictable effect. Skinnerian analysis emphasizes the external properties of the communication process and in that way a measure of clarification is attained. Unfortunately, it allows only the analysis of the results of communication and not the process itself.

Operating out of another tradition, Sapir (1921) suggests linguistic analysis of nonverbal communication, thus providing another interesting attempt at simplification. In Language, Sapir wrote: "We shall no doubt conclude that all voluntary communication of ideas, aside from normal speech, is either a transfer, direct or indirect, from the typical symbolism of language as spoken and heard or, at the least, involves the intermediary of truly linguistic symbolism." The suggestion that communication occurs only through the mediation of the "typical symbolism of language" negates any concern with coding because it holds that "truly linguistic symbolism" is the principal intermediary. All communication becomes, then, ultimately verbal communication. Even the vaguest nonverbal behaviors, Sapir insists, become intelligible because they are automatically and silently translated into the "flow of speech."

Sapir's speculation about the central and predominate role of verbal symbolism is quite notable in that it predates not only the formulation of the principles of linguistics but also predates any systematic interest in the nature of nonverbal communication. However, the emphasis upon verbal symbolism and the centralization of function within the verbal mode reflects the

preoccupation with verbal symbols which has for a long time inhibited the development of a more descriptive theory. Further, there is little evidence that behavior becomes intelligible only when mediated by verbal symbols. Of course, cognitions and the cognitive equivalents of percepts are frequently assessed and processed in terms of a language code. However, individuals who have never heard or seen a verbal symbol in their lives are competent in assigning intelligibility to verbal and nonverbal behavior. Persons born deaf, dumb, and blind demonstrate the competence to deal with the abstractions which are the normal raw materials of language systems. That these individuals 'think' in the signs of American Sign Language and not the symbols of Standard American English, or whatever language is common to their culture, seems to contradict Sapir's contention that only verbal symbolism mediates all communication.

Nonetheless, a tradition of analysis of communicative behavior has sprung up from this contention. Many theorists and researchers utilize linguistic methodology tc study all of communication. For example, the verbal analog approach to the analysis of nonverbal communication is employed by Birdwhistell and Pike, among others. Birdwhistell (1970) presents an elaborate descriptive system, which, for the first time, deals with units of meaning within the nonverbal mode. By analogy with structural linguistics, Birdwhistell's kinesic analysis offers a systematic identification of behavioral units, called kines or kinemorphs, describes their use, and constructs a system of notation to record their occurence. The dependency of Birdwhistell's structural kinesics upon structural linguistics is patently obvious, but Birdwhistell warns that similar processing and a similar method of analysis does not make the various channels employed or the behaviors they convey identical. Nonetheless, he applies, perhaps too broadly, techniques and theories adapted from linguistic research.

Unfortunately, the results of linguistic/kinesic analysis have not provided the hoped for clarification of an underlying relationship between modes. At present, a nonverbal syntax has yet to be isolated; a semantic component of nonverbal behavior, if it exists at all, still awaits discovery; and, finally, the pragmatics of nonverbal communication are only partially understood. In all, it would appear that linguistic methodology is not appropriate for the analysis of nonverbal communication.

Using the verbal analog, Pike (1967) extends the application of linguistic methodology from language behavior to all human behavior. According to Pike, the hierarchical structure of language, a subset of human behavior, reflects the hierarchical structure of non-language behavior. He contends that only through the analysis of simultaneous language and non-language events can communication be understood. In this way, human communicative behavior becomes structurally intelligible "when a theory, a set of terms, and an analytical procedure are provided which deal simultaneously and without sharp discontinuities with all human overt and covert activity." There is great promise in developing such an approach, but there is also serious doubt that structural linguistics offers a sufficiently rigorous methodology to attain this end.

Questions arise from at least two aspects of the linguistic method. First, linguistics employs many arbitrary, if not absolutely fictitious, constructs. Phonemes and morphemes, the smallest units of sound and meaning respectively, may not in fact be units of language perception at all, but instead may be only the linguist's operationalized units of analysis. The compartmentalization of language into these components reveals a need for order that resides more in the nature of man than in the nature of language. Recall that these constructs,

phoneme and morpheme, are used to describe a fleeting record of human behavior which has been isolated in an artificial manner. Linguists freeze in time what is normally continuous, spontaneous behavior and label the units thus isolated. The second question arises because the process of assigning meaning or communicative significance to the isolated units depends upon the informant technique. Native speakers are presented with a recorded language stimulus and asked to report its meaning. Meaning is frequently identified by as few as one informant. No other scientific method places so much faith in a sample of one. Further, it has been noted that in reporting about nonverbal behavior informants are so easily influenced by the researcher that an informant may learn the response expected from him in one trial (Birdwhistell, 1970). Again, it would appear that the verbal analog and its dependence upon linguistic methodology make it an inappropriate tool for the understanding of nonverbal communication.

What is left, then? We may still achieve clarification through simplification, but then one must demonstrate that all communication is nonverbal. Some evidence for this position might possibly be gathered from the fields of anthropology and ethology. It appears that a primitive gesture and pantomime system preceded the ultimate phylogenetic development of language (Lancaster, 1968; Orr and Capparnari, 1964). However, any system of analysis founded upon the assumption that all communicative behavior is fundamentally analogic could not deal with the tortuous linguistic abstractions which even children are capable of. Some other method of analysis must be employed.

There is a classification system which is fundamentally atheoretic. Researchers have suggested the classification of the repertoire of nonverbal behaviors according to their origins, usage and coding. Ekman and Friesen

(1969) offer a categorical scheme which developed from a need to identify and label behaviors isolated by previous research. The five categories, Emblems, Illustrators, Regulators, Affect Displays, and Adapators, are distinguished by the particulars of their usage, their origin, and their coding. Usage refers to the external conditions in which the behavior occurs, its relationship with verbal behavior (temporal and contextual), the awareness and intentionality of the behavior, the feedback which the observer provides, and the type of information conveyed. Origin refers to how the action originally became part of the person's repertoire, that is, the source may be a biological reflex, a species-specific act, or a culturally transmitted instrumental act. Coding refers to the principle of correspondence between behavior and meaning. According to Ekman and Friesen, coding may be intrinsic, iconic extrinsic, or arbitrary extrinsic. However, this scheme is intended only for the analysis of movements and positions of the face and/or body parts. It is limited to these channels and is not applied to other sources of nonverbal information, e.g., paralanguage, dress, make-up, uses of space and time, etc.. Another approach must be employed in order to include consideration of the multi-channel signal system employed in human communication.

Therefore, we suggest combining certain features of each of the formulations discussed above in an integrated, descriptive model which is independent of any particular theory. To this end, we must establish three fundamental postulates: 1.) human communication is mediated by many channels; 2.) information is encoded in a variety of ways; and 3.) individuals employ differential amounts of intentionality, awareness, and feedback in the production of messages. Note that the postulates which we assume are equally applicable to verbal and nonverbal communication. As will be later demonstrated, this model is suitable

for the analysis of a message system which has both verbal and nonverbal components. The model is based upon these postulates because it defines individual message components by reference to three dimensions, channel, code, and intent, rather than by the traditional verbal/nonverbal dichotomy. The traditional terms are generally descriptive, but they are not informative.

Channel

The dimension labelled channel can best be described as having four separate media, each having a number of independent channels. This organization unites channels according to the medium of transmission employed, voice, body, objects, and physical features of the environment. Each channel, in turn, is a physical agency or property of the medium which has the capacity for communicative behavior. Figure 3 shows the relationship between media and channels.

Figure 3 in about here

Voice. There are four channels within the voice medium, speaking, vocal characterizers, voice qualities, and vocal segregates. The multi-channel representation of this medium underscores its capacity for verbal and nonverbal content. Speaking, a clearly verbal behavior, is the principal function of this medium. Other channels within this medium convey nonverbal information through paralinguistic uses of the same mechanism. Vocal characterizers, e.g., burps, laughs, screams, etc., are paralinguistic. They frequently replace verbal behavior, but, alone or in concert with verbalizations, provide rich information. Similarly, voice qualities, e.g., pitch, rate, and intensity, co-occur with verbalizations, but add a measure of redundancy and/or supply the metacommunicational cues necessary for the regulation of verbal exchanges.

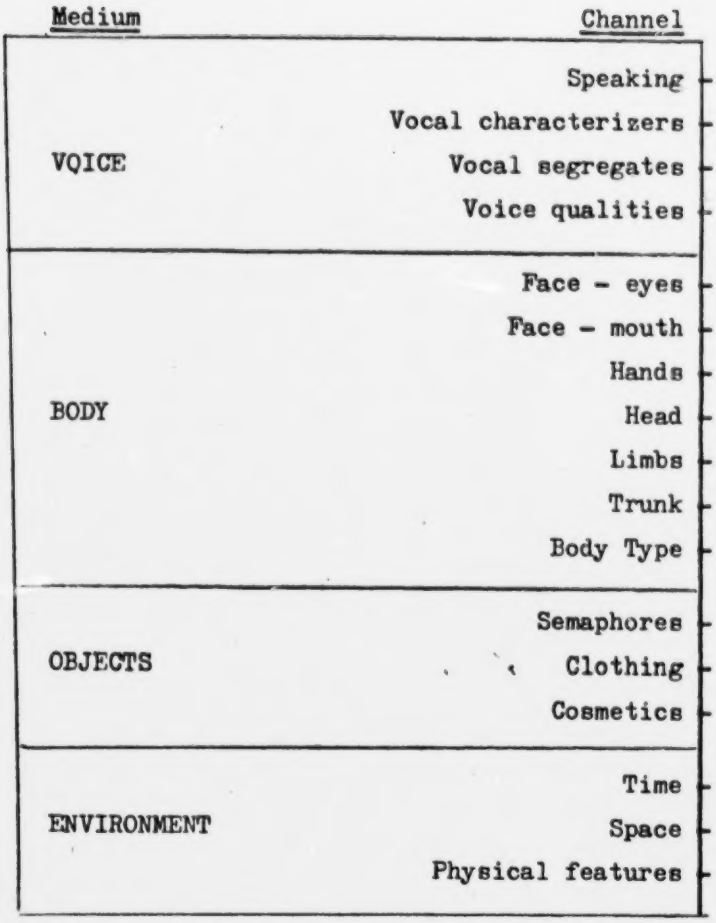

Figure 3. The model which we are constructing has four major media of communication. These media are subdivided into channels. Several of these channels are suitable for the transmission of both verbal and nonverbal information - others handle only one or the other.

Pitch, rate, and intensity often reveal the affective state of speakers - even when verbal content is masked. Finally, vocal segregates, those speech-like interjections which frequently occur between words, e.g., "uh," "hmm," "ahh," may also provide cues about the internal states of the speaker. These behaviors have been used to construct reliable indices of anxiety.

Body. Researchers have focused upon six channels within the body medium. These channels are: the face, the hands, the head, the limbs, the trunk, and body type. We have listed them in order of decreasing channel capacity. The face is the locus of perhaps the two richest sources of nonverbal information, the eyes and mouth. Neural feedback links and complex musculature allow for a nearly limitless range of expressive behaviors within this channel. The hands are nearly equally well served by neural and musculature structure, but the range of expressive behavior is somewhat more limited. Moreover, the hands are capable of verbal and nonverbal behavior whereas the face is not. Writing and finger-spelling are verbal, but the manual gestures which attend speech are nonverbal.

We consider the next three channels, head, limbs, and trunk, as a unit because most of the expressive behaviors conveyed by these channels result from the interaction of all these body parts in movement or posture. This is not to say that these channels are incapable of independent expressive action. For example, head-nods are communicative regardless of the movement or position of the trunk and limbs; shoulders, slumped forward, shrugged, or held rigidly back, communicate individually and in concert with other channels; arms akimbo, crossed or open legs, and nervous fidgeting may provide information without modification by activity within other channels. However, these channels rarely act as the sole source of information. The expressive properties of posture

and movement most frequently result from the interaction of these separate channels. Postural configuration and movement add redundancy, contradict, accent, and/or regulate verbal exchanges.

The communicative function of body type, the sixth channel within this medium, is not well understood. Although, it has been isolated as a possible source of information about overall personality characteristics (Sheldon, 1942; Strongman and Hart, 1968). However, a strong possibility exists that the observed relationship between body type and personality results from socially learned stereotypes and does not arise from actual physical determinants or correlates of personality. All the same, the operation of learned stereotypes can either impede or enhance interpersonal communication. If one expects fat men to be jolly, then expectations may be sufficient to insure happy encounters with endomorphs. Thus, a supposed personality type or trait which is communicated nonverbally through body type may have absolutely no foundation in an objective sense, but may, nevertheless, affect communication because it is strongly founded in our cultural or social reality.

Objects. The manipulation of objects as symbols and signs is the third medium. We identify three channels within this medium: semaphores, clothing, and cosmetics. Semaphores are flags, signal devices, and other visual aids which are used to communicate across distances, within situations where other forms of communication are inappropriate, or when content cannot be communicated by other channels. Semaphores are employed in verbal and nonverbal communication. For example, signal flags may be used to communicate verbally using either Morse or Nautical Signal codes. Our definition extends the usual meaning of semaphores to include other visual signal devices. The color warning code proposed by the National Safety Council which assigns a particular color

to certain types of hazards is an example of a nonverbal code. Jewelry, flags, and decals are also considered nonverbal uses of semaphores. For example, a young woman with a Phi Beta Kappa key pinned to her blouse driving a car with a small woman's liberation flag on the antenna and ecology decal in the rear window uses semaphores intentionally or unintentionally to communicate a substantial amount of information about herself.

Clothing is the second channel within the object medium. Wearing apparel, whether functional or decorative, is a strictly nonverbal channel. A uniform may signify "soldier," "policeman," or "milkman," but there is no direct correspondence between a uniform and verbal equivalents. Similarly, there is no intrinsic property of far out, unconventional dress that signifies a lack of credibility or trustworthiness, and yet the verbal message components produced by an individual in unconventional attire are frequently discounted or ignored. This nonverbal channel acts as an important predictor of the effectiveness of verbal message components.

The third class of objects which serve as a communication channel is cosmetics. We define cosmetics as beauty aids, prosthetic appliances, and other forms of adornment and alteration which humans have devised to beautify and/or modify the body. Lipstick, rouge, and eyeshadow must be included, but then so must wigs, falsies, elevator shoes, wooden legs, earrings, tattoos, and a bone through the nose. There are numerous types of cosmetics which societies, in the richness of creating and transmitting culturel, have devised. Within our culture, straight teeth are cosmetically pleasing. Another culture might prefer sharp black stubs. Cultures may also use cosmetics to communicate about whatever forms of status or institutional identification it deems important. Marital status can be expressed by a lip-plate; warriors communicate

their status by the proud display of scars or some other form of disfigurement; a young woman may not be considered ready for marriage until her entire torso is covered with jewel-like tattoos. The vagaries of culture have resulted in the evolution of cruelly painful signal systems. However, the torture experienced by our young in the process of orthodontia may seem to members of other cultures a painful price to pay for beauty.

Environment. The environment is the fourth medium within which we find channels employed in human communication. Uses of time, space, and the physical environment can communicate. Culture frequently determines appropriate norms for the uses of time and space. Differences in status may be communicated by deviation from these culturally defined norms. One does not apply the same standard of punctuality to a business meeting with superiors, lunch with an insurance salesman, or dinner with dear, old Aunt Tillie. And once there, one does not apply the same standard of proxemic behavior. Aunt Tillie might be slightly put off by an hour's wait for dinner, depending on how hungry she is for company, or dinner, but the boss would be more than put off if he was left waiting. An insurance saleman might wonder about you if you sat as close to him as you would to your Aunt Tillie. The spatio-temporal codes used in the above examples can only communicate nonverbally.

Similarly the arrangement of moveable features of the environment communicates nonverbally, but the operation of the channel and the significance of the content is poorly understood. An individual informs others about personality preferences and life style in the manner in which living space is decorated and maintained. A particular arrangement of furniture may invite a comfortable interaction. On the other hand, desks, coffee tables, and chairs may become barriers between individuals and result in discomfort. A messy

house may communicate to one individual his host's indifference, while another person could interpret the same mess as a signal of welcome and membership in the family group. Frequently the perceiver of the message is left to construe his own meaning.

Coding

The second dimension of our model of human communication is coding. Recall that one of the postulates of our model stated that messages are encoded in a number of ways. When we discuss coding we must turn to the problem of how a relationship is established so that a sign or symbol comes to "mean" the referent object or event. What you are now reading has meaning for you because we share a code. It is through the operation of an extremely complicated digital code that these marks on paper have any significance at all for you. As users of Standard American English we subscribe to a common digital code which specifies, in an arbitrary fashion, that a given symbol will have a more or less commonly understood denotative meaning. The ambiguity of language may place heavy reliance upon context in the ultimate understanding of meaning, but given sufficient contextual cues the meaning of most linguistic symbols can be easily derived. Verbal communications rely upon such digital coding systems. Nonverbal communications may be digitally encoded, but are more often encoded in other ways. For this reason, a model which purports to integrate activity within both modes must consider the coding procedures employed by both. Nonverbal communications rely much more upon analogic encoding in the process of acquiring meaning or significance. Analogic encoding provides a more direct relationship between a sign and its referent. For example, an index finger drawn horizontally across the throat signifies having one's throat cut because, in this instance, the finger is an analogous representation

of a knife. Similarly, obscene gestures frequently gain their meaning because the hand or fingers are used to form analogs of male and/or female genitalia. However, we should not assume that all nonverbal communicative behaviors are encoded analogically. Ekman and Friesen (1969) suggest that some nonverbal behaviors are intrinsically communicative, e.g., affect displays and pupillary and other reflexive responses. They also include two forms of extrinsic encoding, iconic and arbitrary. The classification of coding into three types which vary with respect to the degree of abstraction involved in each suggests a concrete/abstract coding continuum for the second dimension of our model.

Figure 4 in about here

We have added the coding dimension to our model in Figure 4. From most concrete to most abstract, the three types of coding identified by Ekman and Friesen are: intrinsic, iconic extrinsic, and arbitrary extrinsic. Intrinsic coding is employed when the act <u>is</u> the referent. That is, a punch in the nose is not a <u>symbol</u> of anger; it is not a <u>sign</u> of aggression. It <u>is</u> anger; it <u>is</u> aggression. However, waving a fist under someone's nose is an <u>iconic</u> encoding of anger and aggression. In this instance, the behavior is more sign-like or symbolic and hence more abstract. We place iconic encoding farther from the concrete end of the second dimension and closer to the abstract end. This placement should not be construed as descriptive of a scale relationship among types of encoding. It implies only that the fist displayed as an icon of a weapon or an analog of a punch in the nose is a more abstract expressive behavior than a punch. An even more abstract encoding might involve verbal symbolism. The use of the arbitrarily communicative symbols, "I'm so angry

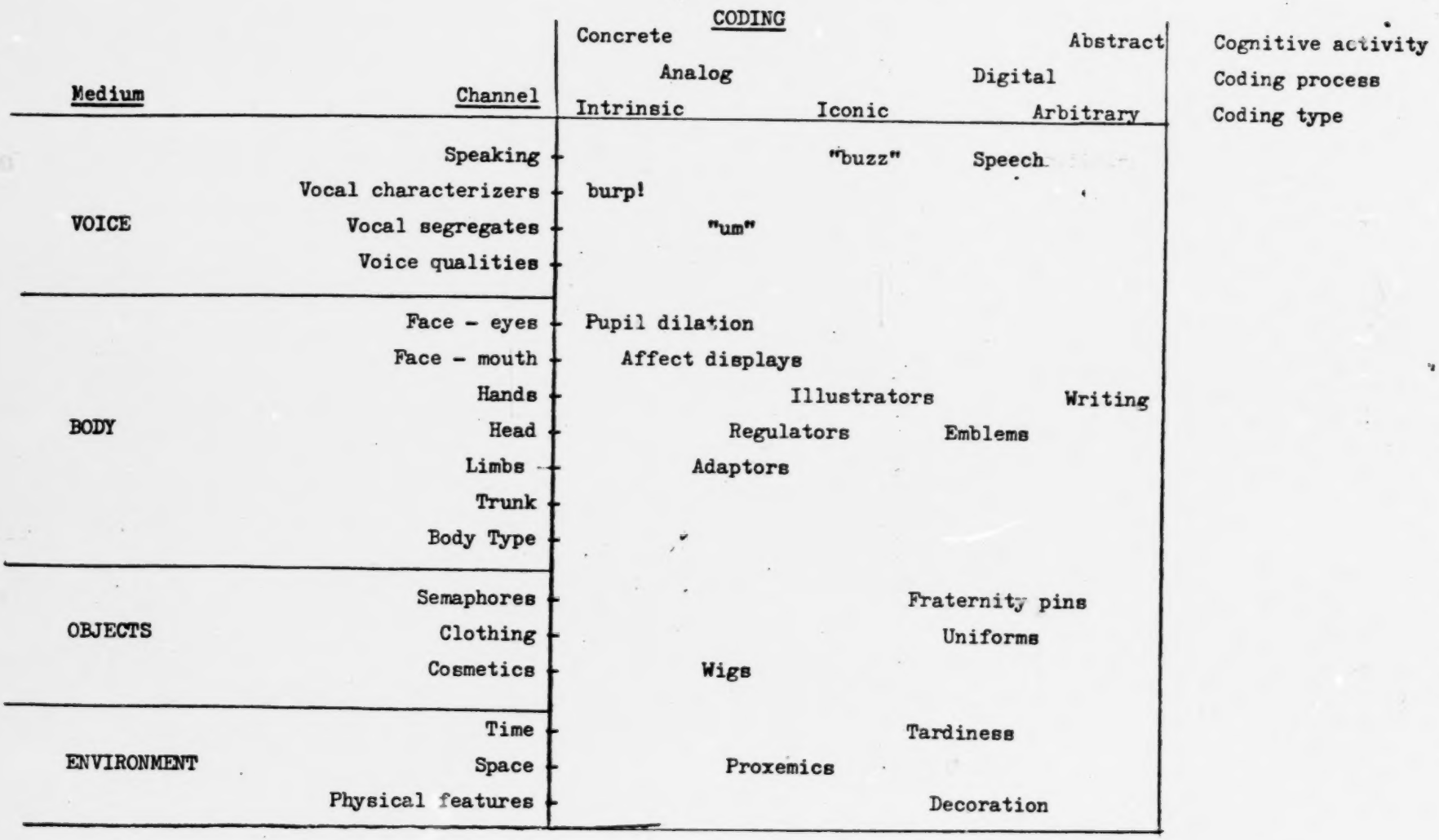

Figure 4. The addition of a second dimension to our growing model allows us to reference particular communicative behaviors. The acts represented within our model represent activities within a given channel employing a given method of coding. Certain of the behaviors may be located within other channels or elsewhere along the coding dimension, but for the most part the location assigned above indicates the appropriate relative position.

with you I could punch you in the nose!", is clearly more abstract than either a punch or nonverbal analogs of a punch. Of course, it is possible for the expression of anger to wax even more abstract, and with a poetic twist, as in the verbal symbols, "You make me sick!" Encoding varies in degree of abstraction and as research continues other points along this continuum may be identified. At present, the three reference points identified by Ekman and Friesen can serve to locate methods of encoding somewhere along the second dimension of our model.

Propositionality

In order to complete the model we must develop a third dimension. So far, we have identified and defined two dimensions which may be used to describe verbal and nonverbal message components. The first two dimensions of our model are based upon properties common to all messages - messages are mediated by channels and encoded in a variety of ways. The third dimension also taps a commonality shared by all messages. Recall that the third postulate holds that in the production of messages individuals utilize different levels of intentionality, awareness, and internal and external feedback. We suggest combining these concepts into a single dimension labelled propositionality.

In the study of speech disorders, it has been noted that certain verbalizations apparently withstand the effects of pathology while other verbalizations reflect the nature and degree of impairment. For example, a stutterer can count a sequence of numbers without disfluencies, but then may stumble over the word "four" when used in a sentence. Some aphasics can recite the days of the week accurately and yet be unable to "find" the appropriate word to answer the question, "What day is today?" Eisenson (1957) stresses the importance of differentiating between non-propositional speech, recitation or non-referential

speech, and propositional speech, communicative or symbolic uses of speech, in understanding speech pathology. That non-propositional or automatic speech survives the effects of pathology better than propositional speech indicates different levels of neural activity for each. In turn, the different levels of neural activity arise from variations in intentionality, awareness, availability of feedback, and other cognitive processes. Variation within and among these internal processes results in different degrees of propositionality for different message components.

In keeping with the integrative nature of this model, we extend the concept of propositionality to expressive behaviors other than speech. Ekman and Friesen (1969) describe the circumstances surrounding the occurrence of nonverbal behaviors in terms of differences in intent, awareness, feedback, and other factors. By analogy, we define a propositional nonverbal behavior as the result of a sender consciously intending to convey a message of which he is aware. The hitch-hiker's thumb gesture is a propositional nonverbal act. A non-propositional nonverbal behavior is the result of unconscious and unintentional activity of the sender. Pupil dilation and constriction is a non-propositional nonverbal event. The first example above, as a willful request for a ride, is produced with the intent to communicate that request; and, assuming that the sender's neural feedback links from hand, arm, and eye to cortex are intact, it is produced with full awareness. However, the second communicative event, pupil dilation or constriction, is not a willful expressive behavior, but nonetheless may communicate about the sender's affective state. The nature of the neural and muscular feedback systems which govern the pupillary reflex rule out any propositionality is of this channel. As noted in the examples above, propositionality is determined by the interaction of intent,

awareness, and feedback.

Figure 5 in about here

The final form of the model is presented in Figure 5. Note that the propositionality dimension is represented as a continuum labelled automatic/propositional. The point labelled automatic references programmed or reflexive behaviors which, while they may be communicative, do not directly involve the full intent or awareness of the sender. Affect displays, GSR, cries of pain, and other expressive acts which are more or less automatically triggered fall on this point of the continuum. Language, finger-spelling, descriptive emblems, and other intentional propositions are marked at the other extreme. Located at other points along the continuum are those expressive behaviors which are communicative but which fall outside focal awareness and involve less than full intentionality, due to a deficit of internal or external feedback. For example, the class of behaviors which Ekman and Friesen call illustrators, nonverbal acts which co-occur with speech to illustrate or emphasize a point, can be placed at various points along this dimension depending upon their usage. A pictoral illustrator describing a spiral staircase is more propositional in nature than movements of the hand which unconsciously beat out the rhythms of speech. Ekman and Friesen's category of nonverbal behaviors called regulators can also be placed at different points of the automatic/propositional continuum. Regulators, acts which regulate or maintain the back-and-forth nature of speaking and listening, range from automatic, e.g., unintentional head-nods and vocal segregates which urge the speaker to continue, to nearly propositional, e.g., postural shifts which indicate leaving or breaking the

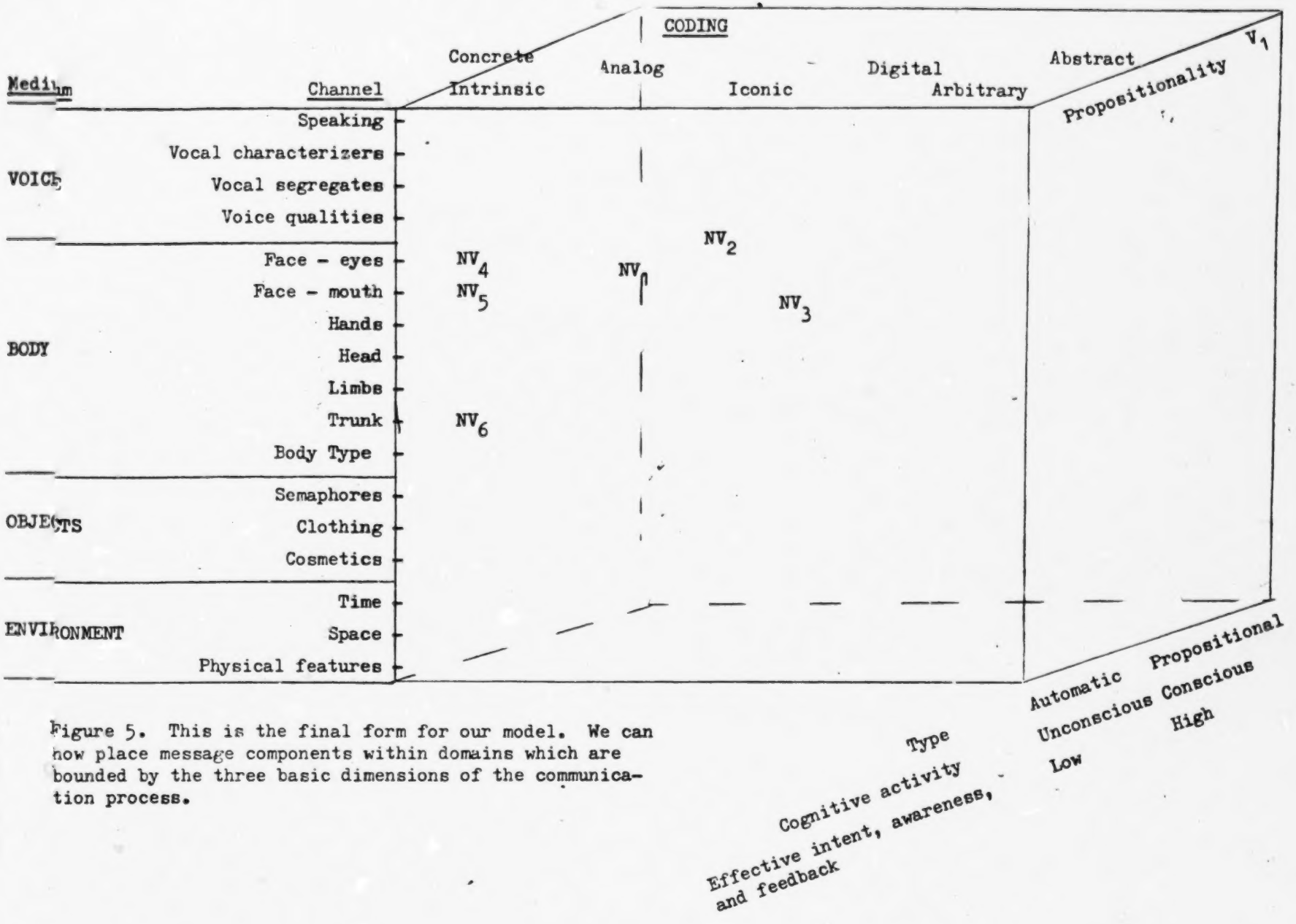

Figure 5. This is the final form for our model. We can now place message components within domains which are bounded by the three basic dimensions of the communication process.

interaction. These latter behaviors are not as propositional as their verbal equivalent, "It's time for me to leave," but nevertheless they can be intentionally informative. However, according to Ekman and Friesen, regulators are unintentional, involuntary acts which are not deliberately performed, i. e., non-propositional. We do not fully agree and conclude that some regulators can be used propositionally.

With the addition of a third dimension, the large cube presented in Figure 5 can be subdivided into many smaller cubes or domains. Each domain delimits potential message components. For the purposes of the discussion which follows, we will assume discrete boundaries for each domain, but in reality the boundaries formed by channel, code, and propositionality would not define cubes. The relationship between different methods of encoding and different levels of propositionality are so flexible and complex that at least those two boundaries would not be fixed, thereby resulting in pulsating, amorphous blobs rather than well-defined cubes.

The usefulness of this model can be demonstrated by identifying the various domains within which the components of a sample message reside. Consider this episode: A woman on a diet is offered a plate of cookies by her hostess. She is hungry, but frowns when she sees the cookies, looks up at her friend and smiles warmly, extends her hand in a pushing motion directed at the cookies, and says, "No thank you, I'm not hungry." Her pupils are dilated, her mouth waters, and her stomach growls softly.

This simple event involves considerably more components than those described above, but we will limit our discussion to the most obvious and ignore those elements which cannot be well described in writing, e. g., intonation, minute facial displays, postural shifts, etc.. That leaves seven major components, one verbal and six nonverbal, to be located within the model. The domain in

which the verbal component resides is labelled V_1 in Figure 5. In the first dimension, it is bounded by the speaking channel; in the second dimension, it is bounded by arbitrary encoding; and, in the third dimension, it is bounded by a high level of propositionality.

The six nonverbal components which we can place within the model are: 1.) reflexive frowning at the cookies; 2.) intentional smile of reassurance to the hostess; 3.) blocking gesture directed at the cookies; 4.) pupil dilation indicating interest in the cookies; 5.) reflexive salivation revealing hunger; and, 6.) relexive stomach contraction and noise which also indicate hunger. In Figure 5, the frown and the smile, NV_1 and NV_2, are bounded by identical channel, the face, and type of encoding, nearly intrinsic. However, the frown is more reflexive than the smile and therefore is identified as less propositional. The blocking gesture, NV_3, which here emphasizes the verbal "No thank you," is bounded by the hand channel, iconic coding, and a moderate level of propositionality. The remaining nonverbal components, the reflex activity of pupils, salivary glands, and stomach, NV_4, NV_5, and NV_6 respectively, are defined by different channels, but the type of encoding and the degree of porpositionality are roughly identical for all three. For these components, coding is intrinsic and there is a low level of propositionality involved in the acts.

The model we have suggested in this paper expands upon the traditional description of communicative behaviors as either verbal or nonverbal. Rather, this model is desinged to emphasize the role which various channels, codes, and levels of propositionality play in the production of the total message. In this way, the model provides a more informative description of communicative behaviors than traditional approaches. Indeed, if communication arises from the interaction of a multitude of verbal and nonverbal behaviors, then a descriptive model should account for the individual behaviors and their interrelationships. The present model achieves that end.

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